

### VIII.3.3-RES-SNGL-PO1 SINGLE RESERVOIR REGULATION OPERATION PO ARRAY LAYOUT FOR GENERAL AND SPECIFIC PARAMETERS AND TIME SERIES

The PO array has subsections used to store the parameters and time series information needed to for Operation RES-SNGL.

The CO array is used to store carryover data and pointed to from values held in the PO array.

Two general notes about parameter storage:

- o all values are converted to and stored in metric units (conversion factors are determined by UNITS code)
- o all parameter values needed for operation execution are stored

If their input is optional, defaults will be provided and stored.

#### Parameters

##### **GENERAL Parameters**

The only GENERAL parameters needed are the elevation-storage curve and the interpolation option:

- o number of pairs of elevations/storage (N)
- o N values of elevation
- o N values of storage
- o interpolation option:
  - 0 = linear
  - 1 = logarithmic

The start of the GENERAL parameters is indicated in word 10 or PO array.

##### **SPECIFIC Parameters**

The parameters needed to define all the Scheme/Utilities used in the operation definition follow the GENERAL parameters. Pointers are held for each Scheme/Utility defined giving the location in the PO array of the start of the parameters as well as for time series and carryover (held in CO array). These pointers start in word 21 of the PO array and there are four values held for each Scheme/Utility:

- o Scheme/Utility number (base plus level of definition) (see Section VIII.3.3-RES-SNGL-PO2 for detailed information)
- o location in PO array of start of parameters
- o location in PO array of start of time series information
- o location in CO array of start of carryover information

A value of zero for any pointer indicates that no information of that type is needed by that Scheme/Utility.

All parameters are stored in the order that they are listed for input in Section V.3.3-RES-SNGL. When a parameter is listed as optional, it is optional only for input. If a value is not provided by the user, a default is supplied by the input routine. Descriptions of the order that parameters are stored in the subroutines that extract them for use in execution. The EX26 level 2 routines are:

XS0126 through XS1326 - for schemes  
 XU1426 through XU2426 - for utilities (no XU1926)

Parameters are either single-valued and multi-valued. Single-valued parameters are stored simply as the value they take on. Multiple-valued parameters (usually curves) can be defined in one of two ways:

- o entire definition found at point needed
- o reference made to original definition

At the point where the curves are defined, there will be the number of pairs of values defining the curve followed by that number of the first part of the curve and then that number of the second part of the curve. For example, a spillway discharge curve will have the number of pairs of elements n each part of the curve, say N, followed by N values of elevation and N values of discharge. A reference to an original definition is indicated by a negative number for the number of pairs in the curve. The absolute value of that negative number is the location in the PO array (relative to the start of all parameters in the PO array) of the original definition of that curve. The multiple reference curves and the Scheme/Utilities that potentially can reference them are:

<u>Curve Name</u>	<u>Scheme/Utility Names</u>
RULECURVE	RULECURVE, POOLQ, MINQ, INDSRCHGE, RULEADJ, POWERGEN
ELVSQ (Spillway rating)	MAXQ, FILLSPILL, SPILLWAY
HEADVSQ	MAXQ, FILLSPILL, SPILLWAY
Entire SPILLWAY parameter set	FILLSPILL, SPILLWAY

If a curve is optional and is not used, the number of pairs of values will be zero.

## Time Series

### **GENERAL Time Series**

There are 6 time series that are stored in the PO array for GENERAL definition. The first 3 are required, the second 3 are optional. The format for storing time series is the same for both GENERAL and SPECIFIC ones. The following values are stored if a

time series is used:

- o identifier (2 words)
- o data type
- o data time interval
- o input/output indicator:
  - 0 = input
  - 1 = output

If a time series is optional and is not used, the only information stored will be a two-word blank identifier.

The pointer to the start of time series information in the PO array is held in word 11 of the PO array. The first word in the time series subsection is the number of time series (both nonblank and blank identifiers count as a time series stored).

### **SPECIFIC**

Any time series defined by a Scheme/Utility will be stored in the order described in the input section (V.3.3-RES-SNGL). Undefined optional time series are denoted by an all blank identifier (2 words). For certain Scheme/Utilities (SETQ, SETH and STPOOLQ), use of time series is indicated by a parameter value. They are omitted if not used. Notes on all time series used by the Scheme/Utilities are on a following page.

Specific time series information held in PO array is:

<u>Scheme/ Utility</u>	<u>Total Number Allowed</u>	<u>Indicated by omission or blank if not used</u>
# 2. SETQ	1	omitted if not used
# 3. SETH	1	omitted if not used
# 5. FILLSPILL	3	two blanks if not used (all optional)
# 6. SPILLWAY	2	two blanks if not used (all optional)
# 8. STPOOLQ	2	omitted if not used, number of time series = ngages (i.e., the first parameter in PO array)
#10. MINH	2	two blanks if not used (first required, second optional)
#12. FLASHBDS	5	non-blanks
#14. RULEADJ	1	non-blanks (required)
#16. RAINEVAP	3	PCPN required, EVAP omitted if not used and ADDQ two blanks if not used
#17. ADJUST	7	two blanks if not used (first and/or

<u>Scheme/ Utility</u>	<u>Total Number Allowed</u>	<u>Indicated by omission or blank if not used</u>
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second, third must be entered; fourth, fifth, sixth and/or seventh must be entered)

#18. BACKFLOW	2	non-blanks, both are required
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Time series keywords in order of appearance in PO array are:

<u>Scheme/ Utility</u>	<u>Total Number</u>	<u>Keyword</u>
# 2. SETQ	1	SQTS
# 3. SETH	1	SHTS
# 5. FILLSPILL		3
1. QLIM		2. QGEN 3. QSLUICE
# 6. SPILLWAY	2	1. QGEN 2. QSLUICE
#10. MINH	2	1. UPQ 2. UPSTAGE
#14. RULEADJ	1	ELEV
#16. RAINEVAP	2	1. PCPN 2. EVAP
#17. ADJUST	7	1. OBSQO 2. OBSQOM 3. OBSH 4. ADJQO 5. ADJQOM 6. ADJH 7. ADJS
#18. BACKFLOW	2	1. OBSQ 2. OBSH